

I. Claim Objection

In the Office Action, the Examiner stated that there is insufficient antecedent basis for the claim limitation "the one or more metal oxides" in claim 5. Because the Applicants have amended claim 5 so that it is dependent on claim 4, this objection is now moot.

II. Claim Rejections

A. Rejection under 35 U.S.C. 102(e)

In the Office Action, claims 1-9, 11, 13-15, 32-34, 36 and 38-47 were rejected under 35 U.S.C 102(e) as being anticipated by US Patent No. 6,045,896 ("Boire").

1. The Present Invention

The present invention relates to glazing materials. As defined in amended claim 1, the present invention is a solar control article, comprising:

a substrate having a surface;

a coating over the surface to provide a coated article having a visible light transmittance in the range of about 50 to about 70%, a shading coefficient less than 0.33, and a reflectance less than about 30%, the coating comprising

at least one antireflective layer over the substrate surface; and

at least one infrared reflective film over the at least one antireflective layer, wherein at least one antireflective layer has a thickness of about 272 to about 332 angstroms.

2. The Boire Reference

The invention of Boire relates to a glazing assembly. As defined in claim 1, the invention of Boire is a glazing assembly comprising:

at least one transparent glass substrate and a stack of thin layers thereon, wherein said stack of thin layers comprises n functional layers having reflection properties in the infrared, in solar radiation or in both, and (n+1) coatings, wherein said coatings comprise one or more layers, at least one of which is made of a dielectric

material, said functional layers and said coatings alternating so that each functional layer is placed between two coatings, wherein $n \geq 1$;

wherein, when the substrate is subjected to a heat treatment selected from the group consisting of toughening, bending and annealing, in order to preserve the optical quality of the stack at least one of the following must be satisfied:

the coating placed on top of at least one of the functional layers includes at least one barrier layer comprising a material forming a barrier to at least oxygen and water, wherein said material is selected from the group consisting of SiO_2 , SiO_xC_y , SiO_xN_y , Si_3N_4 , and mixtures thereof; or

at least one absorbent layer comprising a material capable of absorbing the constituent material of said functional layer or a layer that is stabilizing with respect to said constituent material forms at least a part of;

(a) either the coating placed on top of the functional layer or under the barrier layer; or (b) the coating placed under the functional layer.

Table 3 contains information regarding the thickness ranges for each layer in the invention of Boire.

3. Traverse of the Rejection

In order for a rejection to be proper under 35 U.S.C. 102, a reference must disclose each and every element of the invention. See, e.g., In re Spada, 911 F.2d 705, 708, 15 USPQ2d 1655, 1657 (Fed. Cir. 1990). If a prior art reference does not expressly set forth a particular element of the claim, that reference still may anticipate if that element is "inherent" in its disclosure. To establish inherency, the extrinsic evidence "must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Continental Can Co. v. Monsanto Co., 948 F.2d 1264, 1268, 20 U.S.P.Q.2d 1746, 1749 (Fed. Cir. 1991). Inherency, however, may not be established by probabilities or possibilities.

In this case, the coating of the present invention is a solar control article comprising at least one antireflective layer over the substrate surface and at least one infrared reflective film over the at least one antireflective layer. The shading coefficient of the solar control article is required to be less than 0.33.

As stated in the Office Action, Boire fails to specifically mention a shading coefficient or U value. However, the Examiner claims that Boire inherently possesses the requisite shading coefficient.

The shading coefficient can be obtained by dividing the solar factor by 0.87. The solar factor (can be) is the ratio of total solar energy flux entering through the glass to the incident solar energy flux. The total solar energy (can be) is the sum of the incoming solar energy by direct transmission and the energy reradiated by the glass to the inside atmosphere after being absorbed by the glass.

Clearly, the shading coefficient is not an inherent characteristic. The shading coefficient is a parameter that can be manipulated for a given piece of glass.

Whereas Boire broadly teaches a coating that has various material within certain thickness ranges, Boire does not teach or disclose a coating that has particular materials and larger thicknesses chosen to provide a coating having a shading coefficient less than 0.33. Therefore, the shading coefficient is not an inherent property under the law. As stated above, inherency may not be established by probabilities or possibilities. Because the required shading coefficient is not an inherent property of the Boire invention, Boire fails to disclose each and every element of the present invention. Therefore, the rejection of claims 1-9, 11, 13-15, 32-34, 36 and 38-47 under 35 U.S.C. 102(e) as being anticipated by Boire are improper and should be withdrawn.

B. Rejections under 35 U.S.C. 103

1. Rejection over Boire

In the Office Action, claims 10, 12, 16-18, 20-25, 27-28, 35, 37, 43, and 46-47 were rejected under 35 U.S.C. 103(a) as being unpatentable over Boire.

a. Traversal of the Rejection

To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on Applicant's disclosure. In re Vaeck, 947 F2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

As defined in claim 16, the present invention is a solar control coated article, comprising:

- a transparent substrate having a surface;

- a coating over the surface to provide a coated article having a visible light transmittance in the range of about 50 to about 70%, a shading coefficient less than about 0.33, and a reflectance less than about 30%, the coating comprising:

- a first antireflective layer over a substrate surface, wherein the first antireflective layer has a thickness of about 272 to about 332 angstroms;

- a first infrared reflective layer over the first antireflective layer, wherein the first infrared reflective layer has a thickness of about 86 to about 269 angstroms;

- a first primer layer deposited over the first infrared reflective layer, wherein the primer layer has a thickness of about 15 to about 30 angstroms;

- a second antireflective layer deposited over the first primer layer, wherein the second antireflective layer has a thickness of about 198 to about 836 angstroms;

a second infrared reflective layer deposited over the second antireflective layer, wherein the second infrared reflective layer has a thickness of about 159 to about 257 angstroms;

a second primer film deposited over the second infrared reflective layer, wherein the primer layer has a thickness of about 15 to about 30 angstroms; and

a third antireflective layer deposited over the second primer layer, wherein the third antireflective layer has a thickness of about 60 to about 273 angstroms.

In contrast to the present invention, the Boire reference discloses a second Ag layer having a thickness ranging from 8-12nm (80-120Å). See Table 3 in Boire. This layer is much thinner than the 159 to about 257 angstroms required for the second infrared reflective layer of the present invention.

The Boire reference also discloses a second Ti layer having a thickness ranging from 0.5-1.5nm (5-15 Å). This layer is thinner than 15 to about 30 angstroms required for the second primer film of the present invention.

Further, as stated above, Boire fails to teach or disclose the shading coefficient or U value of the present invention.

Because Boire does not disclose the required shading coefficient and the limitations related to thickness of the various layers, the Boire reference does not teach or suggest all the claim limitations of the present invention. Consequently, the rejection of claims 16-18, 20-25, and 27-28 under 35 U.S.C. 103(a) as being unpatentable over Boire is improper and should be withdrawn.

2. Rejection over Arbab

In the Office Action, claims 1-18, 20-28, 32-39, and 43-46 were rejected under 35 U.S.C. 103(a) as being unpatentable over Arbab.

a. The Arbab Reference

The invention of Arbab relates to multiplayer high transmittance, low emissivity coatings on a transparent substrate. As defined in claim 1, the invention of Arbab is a high transmittance, low emissivity coated article comprising:

- a. a transparent, nonmetallic substrate;
- b. a dielectric, antireflective base film overlying the substrate, the base film including a zinc-tin oxide support film-part overlying the substrate and a crystalline metal-contacting film-part selected from the group consisting of indium tin oxide, zinc-aluminum oxide, zinc oxide and mixtures thereof overlying the support film-part;
- c. a metallic reflective film deposited on the crystalline metal-contacting film-part of the base film, the metallic film having two levels of electrical resistivity, one level being lower than the other;
- d. a primer film overlying the metallic reflective film; and
- e. a dielectric, antireflective film overlying the primer film;

wherein the metal-contacting film-part directs said metallic film to the lower of said two levels.

In the Example section of Arbab, the following transmittance values are disclosed. For Example 1, a visible transmittance of 76% is disclosed. See col. 12, line 45. For Example 3, a visible transmittance of 81.6% is disclosed. See col. 20, line 20. For Example 4, a visible transmittance of 84% is disclosed. See col. 21, line 10.

b. Traversal of the Rejection

The rule for a proper rejection under 35 U.S.C. 103 is stated above. In this case, the present invention has a visible light transmittance in the range of about 50 to about 70%. As shown above, the Arbab reference as exemplified by Examples 1, 3,

and 4 do not teach and disclose a coated article having the requisite visible light transmittance.

Because the Arbab reference does not teach or disclose a coated article having the required visible transmittance, the Arbab reference does not teach or suggest all of the claim limitations of the present invention. Therefore, the rejection of claims 1-18, 20-28, 32-39, and 43-46 under 35 U.S.C. 103(a) as being unpatentable over Arbab is improper and should be withdrawn.

3. Rejections of Dependent Claims

In the Office Action, the Examiner made the following rejections of dependent claims under 35 U.S.C. 103:

1. Claims 26 and 46-47 were rejected under 35 U.S.C. 103(a) as being unpatentable over Boire as applied to claims 10, 12, 16-18, 20-25, 27-28, 35, 37, 43, and 46-47 above, and further in view of US Patent No. 5,821,001 ("Arbab").

2. Claims 40-41 were rejected under 35 U.S.C. 103(a) as being unpatentable over Boire as applied to claims 1-9, 11, 13-15, 32-34, 36, and 38-45 above, and further in view of US Patent No. 5,77,603 to Zagdoun ("Zagdoun").

3. Claim 42 was rejected under 35 U.S.C. 103(a) as being unpatentable over Boire as applied to claims 1-9, 11, 13-15, 32-34, 36, and 38-45 above, and further in view of Zagdoun and US Patent No. 4,863,540 ("Catalano")

4. Claims 40-41 were rejected under 35 U.S.C. 103(a) as being unpatentable over Arbab as applied to claims 1-18, 20-28, 32-39 and 43-46 above and further in view of Zagdoun.

5. Claims 42 and 47 were rejected under 35 U.S.C. 103(a) as being unpatentable over Arbab as applied to claims 1-18, 20-28, 32-39, and 43-46 above, and further in view of Zagdoun and Catalano.

6. Claim 44 was rejected under 35 U.S.C. 103(a) as being unpatentable over Arbab as applied to claims 1-18, 20-28, 32-39, and 43-46 above, and further in view of US Patent No. 4,489,134 ("Yudenfriend").

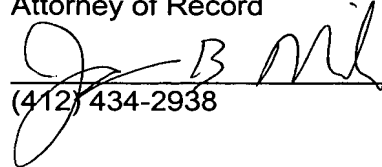
In light of the remarks above, independent claims 1, 16, and 32 in the application are in condition for allowance. Consequently, all of the rejections above are moot.

CONCLUSION

In light of the amendments and remarks presented in this correspondence, the rejections of claims 1-9, 11, 13-15, 32-34, 36 and 38-47 under 35 U.S.C. 102(e) as being anticipated by Boire; claims 10, 12, 16-18, 20-25, 27-28, 35, 37, 43, and 46-47 under 35 U.S.C. 103(a) over Boire; and claims 1-18, 20-28, 32-39, and 43-46 under 35 U.S.C. 103(a) as being unpatentable over Arbab should be withdrawn. Claims 1-18, 20-28, and 32-47 should be in condition for allowance. If any questions remain about this application, please call me at the telephone number listed below. Thank you.

Respectfully submitted,

JACQUES B. MILES
Registration No. 42,888
Attorney of Record


(412) 434-2938

Pittsburgh, Pennsylvania
September 25, 2003